

HR Data Analysis

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Contents

1. Project Objective.....	2
2. Dataset Description	2
3. KPIs and Metrics	3
4. Data Preparation & Transformation	3
5. Dashboard Design	4
6. Insights & Findings	7
7. Recommendations.....	8
Conclusion.....	8

1. Project Objective

The purpose of this HR Analytics project is to design and implement a professional Power BI dashboard that enables executives to gain actionable insights into the organization's workforce.

Specifically, the project aims to:

- Analyze attrition drivers and identify high-risk departments, locations, and tenure groups.
- Provide a view of workforce composition, including headcount, pay equity, tenure distribution, and performance spread.
- Monitor talent movement, including monthly hiring and attrition trends.
- Assess employee performance and training effectiveness, surfacing low-performing but long-tenured employees for targeted interventions.

By fulfilling these objectives, the dashboard supports data-driven HR decisions, reduces turnover costs, and enhances workforce planning.

2. Dataset Description

The dataset provided includes employee-level HR data with the following columns:

- Employee ID & Name – unique identifier for each employee.
- Department – the functional area employees belong to.
- Location – work location of each employee.
- Job Title – designation held by the employee
- Hire Date – employee's start date, used to calculate tenure.
- Salary – annual compensation.
- Performance Rating – employee performance evaluation on a 1–5 scale.
- Training Hours – hours of training received in the year.
- Attrition Status – Yes/No flag indicating if the employee has left.

Data structure, quality, and completeness

- The data is structured, row-per-employee.
- Completeness: All employees have values for critical columns (ID, Dept, Location, Salary, Hire Date, Attrition).
- Gaps: Some inconsistencies in categorical values (e.g., trailing spaces in departments) were cleaned.
- Salary and Training Hours showed natural variation with outliers retained for business interpretation.

3. KPIs and Metrics

Key metrics derived from the dataset include:

- Headcount = Distinct employees currently active.
- Attrition Rate = $\text{Attrited} \div \text{Headcount}$.
- Attrited Employees = Count of employees with Attrition Status = "Yes".
- Hires = Employees hired per month/year.
- Average Salary = Mean of salaries.
- Median Salary = Median of salaries (to detect skew).
- Performance Distribution = % of employees in rating buckets (1–5).
- Average Performance Rating = Mean performance rating.
- High Performer % = % employees with ratings ≥ 4 .
- Average Training Hours = Mean of training hours.
- Training Coverage $\geq 40\text{h}$ = % employees with training ≥ 40 hours.
- Tenure Years = Years since hire.
- Tenure Buckets = Segmentation (<2y, 2–4y, 4–6y, 6–8y, 8y+).
- Low-Perf-Long-Tenure Flag = Employees with $\text{Perf} \leq 2$ & $\text{Tenure} \geq 6\text{y}$.

4. Data Preparation & Transformation

Derived Features

- Attrition Flag = IF Attrition = "Yes" then 1 else 0.
- Tenure Years = $\text{DATEDIFF}(\text{Hire Date}, \text{Today}, \text{Year})$.
- Tenure Bucket = Grouping of Tenure Years.
- Training Bucket = Grouped into 0–20, 20–50, 50–80, 80+.

Dimension Tables

- DimDepartment – Unique department list with surrogate key.
- DimLocation – Unique location list with surrogate key.
- Date Table – Continuous calendar with Year, Month, Quarter, Month-Year.

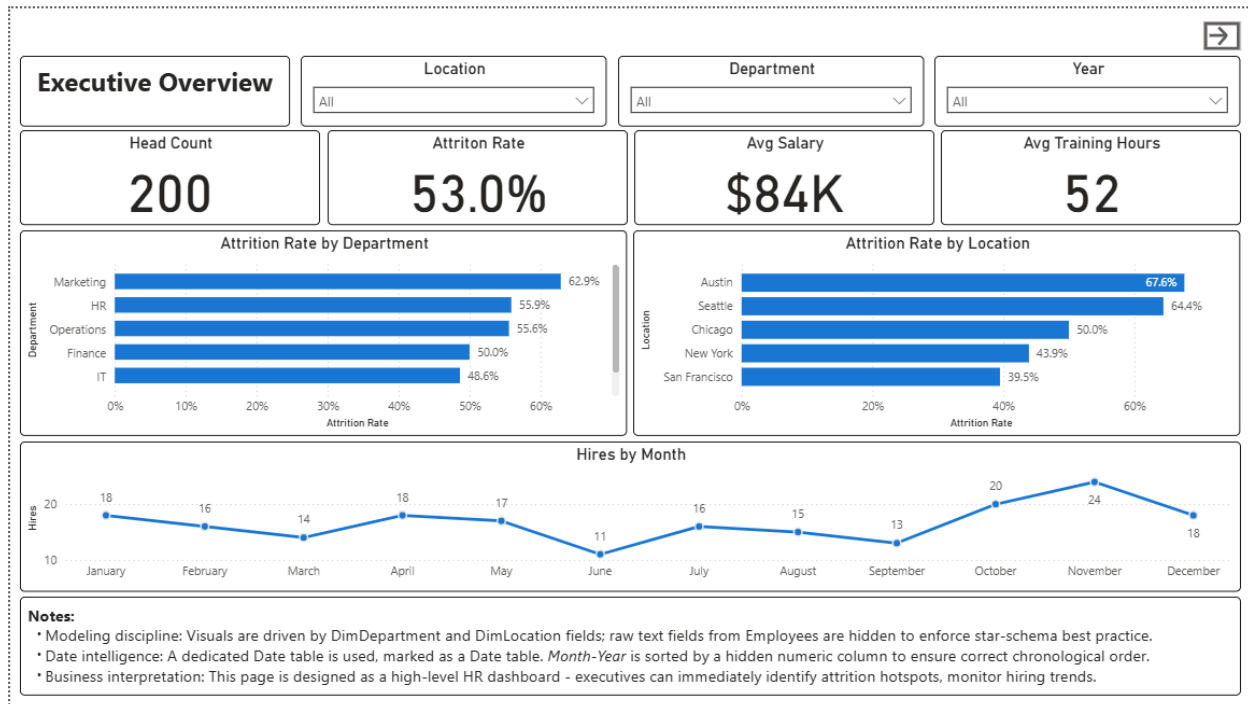
Relationships

- Employees[Department] → DimDepartment[Department]
- Employees[Location] → DimLocation[Location]
- Employees[Hire Date] → Date[Date]

5. Dashboard Design

Page 1 – Executive Overview

- KPIs: Headcount, Attrition Rate, Avg Salary, Avg Training Hours.
- Attrition Hotspots: Bar charts for Dept & Location.
- Hiring Trend: Monthly hires (last 24 months).
- Notes: Short commentary on top findings.



Page 2 – Workforce Composition

KPIs: Avg Salary, Median Salary, Avg Perf Rating, Attrition Rate.

Visuals:

- Headcount by Department.
- Headcount by Location.
- Tenure Segmentation.
- Salary Avg vs Median by Department.
- Performance Ratings Distribution.

Purpose: Assess the balance of workforce, pay equity, and performance mix.



Page 3 – Talent Movement

KPIs: Attrition Rate, Attrited Employees, Hires YTD, Avg Tenure of Attrited Employees.

Visuals:

- Attrition Trend by Month-Year.
- Attrition by Tenure Bucket.
- Attrition by Department.
- Hiring Trend (24 months).
- Hiring vs Attrition Comparison.

Purpose: Show inflow/outflow trends, highlight retention risks.



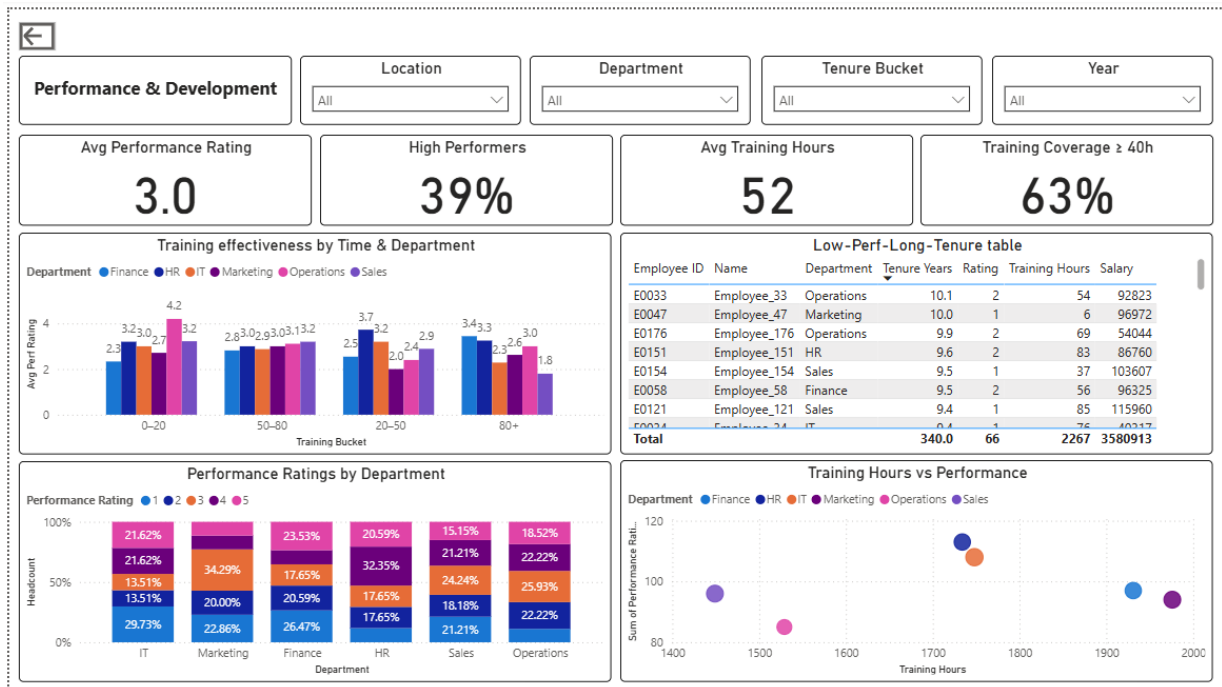
Page 4 – Performance & Development

KPIs: Avg Perf Rating, % High Performers, Avg Training Hours, Training Coverage $\geq 40h$.

Visuals:

- Performance Ratings by Department.
- Scatterplot: Training vs Performance.
- Table: Low-Perf-Long-Tenure employees.
- Training Effectiveness by Bucket & Department.

Purpose: Assess talent quality, training ROI, and surface priority coaching cohorts.



6. Insights & Findings

1. Attrition Risks

- Overall attrition is ~53%, much higher than industry benchmarks.
- Marketing and HR show the highest attrition rates, despite smaller size.
- Austin and Seattle locations face attrition above 60%.

2. Workforce Composition

- Sales and IT dominate headcount; Marketing and HR are smaller but attrition-prone.
- In Sales, average salary is higher than median → skewed by high earners.
- Performance distribution in Marketing is skewed toward ratings ≤ 2 .

3. Talent Movement

- 2–4 year tenure bucket has highest attrition → retention challenge post-ramp-up.
- Hiring peaked in 2023 but slowed in 2024.
- In several months, attrition nearly matched hiring, threatening net growth.

4. Performance & Development

- Avg performance rating ~3.0, but variance across departments.
- Training hours not strongly correlated with higher performance.
- ~20% of employees are long-tenure but low-performing → a priority risk group.

7. Recommendations

- Retention Strategy
 - Focus on at-risk depts (Marketing, HR) and locations (Austin, Seattle).
 - Conduct exit interviews to diagnose causes.
- Early Attrition Mitigation
 - Enhance onboarding for employees <2 years.
 - Introduce mentoring programs to improve ramp-up.
- Compensation & Pay Equity
 - Review pay structures in Sales to address inequities.
 - Ensure market competitiveness in HR and Marketing.
- Performance & Training
 - Redesign training to target skill gaps instead of blanket hours.
 - Link training completion with performance reviews.
- Long-Tenure Low-Performance
 - Identify ~20% of staff with tenure ≥6y but perf ≤2.
 - Apply targeted coaching, redeployment, or performance management.

Conclusion

The dashboard provides an end-to-end HR view across attrition, workforce composition, hiring dynamics, and talent development. It highlights critical risks (high attrition, pay skew, low-performing veterans) and provides actionable levers (targeted retention, onboarding improvements, training redesign).

By adopting these recommendations, leadership can reduce attrition costs, improve workforce quality, and align HR initiatives with business strategy.